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Environment & Social Welfare Bulletin, India (ESW Bulletin, India)

(Dedicated to Environment, Education, and Science & Technology)

Published By
Environment and Social Welfare Society, Khajuraho-471606 India
(Dedicated to Environment, Education, and Science & Technology)
In Association with
Godavari Academy of Science & Technology, Chhatarpur 471001 India.
Email: **eswsociety320@gmail.com; editor@godavariacademy.com**

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Dr. Ashwani Kumar Dubey
Editor-in-Chief
ESW Bulletin, India

Environment & Social Welfare Society, Khajuraho- India
Dedicated to Environment, Education, and Science & Technology entire India since millennium,
Accredited by JAP, Government of Madhya Pradesh

Key Note Address

The interest of man in forests goes back to his own origin and history. From stone stage to modern atomic age, there has been a drastic change in the demands of man from the forests ranging from food and shelter to timber, fuel, medicines, pulp and a variety of other products. A sudden explosion in human population and multifarious need of men has put the existence of forests to a stake. Majority of original forests have been reduced to secondary forests with low productivity hence the extent of wild area is also decreased significantly.

Natural resources are materials and components found within the environment. Every man-made product is composed of natural resources. A natural resources may exist as a separate entity such as freshwater, and air, as well as a living organism such as a fish, or it may exist in an alternate form which must be processed to obtain the resource such as ores, oil, and most forms of energy.

Knowledge, expertise, experience and scientific skills need to be coupled for better outcome, which ultimately lead to a innovative world of resource pools and knowledge bases.

Dr. Ashwani Kumar Dubey

About Environment & Social Welfare Bulletin, India (ESW Bulletin, India)

Environment and Social Welfare Society,Khajuraho started ESW Bulletin, India with the aim to encourage Student, Researcher, and Writer for contribution of scanty knowledge in the field of Education, Life Sciences, Sciences, Research, Environmental Sciences, Natural Resources Conservation and Sustainable Development, and in the field of Literature. We serve Environment and Human welfare at the highest levels of Ethical Conduct.

Aim and Scope

Environment and Social Welfare Bulletin, India is an open access peer-reviewed online Bulletin published half yearly. The primary objective is to become the premier source of high quality article from the entire world. ESW Bulletin, India provide a platform to all scientists, researchers, academicians, industrialists, readers and writers to share their ideas, knowledge, information and findings among the people of their own fraternity. The major emphasis will be on publishing quality articles rapidly and making them freely available to writers worldwide. The result of work will be published in The ESW Bulletin, India in which the central theme is the mechanism by which factors affects Environment and Society as well as living organism.

Article Submittion

Environment and Social Welfare Bulletin, India (ESW Bulletin, India) publishes manuscript in any area of Education/ Life Sciences/ Sciences/ Research/ Environmental Sciences/ Natural Resources Conservation and Sustainable Development/ Science & Technology/ Biotechnology/ Human & Social Welfare. Special issue of the Bulletin on proceeding of the District/ State/ National/ and International Conferences/ Symposium/ Seminar/ Workshop can also be publishes with one or more of the organizers as Guest Editors. The Guest Editors should be Fellow of the Environment and Social Welfare Society,Khajuraho India. Guest Editors shall be responsible for ensuring quality and proper referring of the manuscript.

Niche areas

Science Achievements, Forest Conservation**,** Water Conservation, Child Health Care**,** Human Health and Medicin**,** Save Planate**,** Donate Blood Save Life**,** Biodiversity**,** Environmental Impact Assessment**,** Oceanography, and Drug De-addiction. ***(For January to July Issue).***

Animal Welfare, Society and Human Welfare**,** Global Health**,** Wildlife Conservation**,** Food Security**,** Children's Celebration, AIDS**,** Pollution Control and its legislation, Human Right, and Biodiversity. ***(For July to December Issue).***

However, the above titles are not exhaustive and article in other niche areas are also considered if the article useful for Environment, Education, and Science & Technology advancement in the nation.

Instruction for Authors

The manuscript should be original types in MS Word A4 size paper (in English Times New Roman font size-12 and in Hindi Kurtidev 010 font size-14) should be submitted electronically as attachment at Email ID: eswsociety320@gmail.com or

editor@godavariacademy.com or send by registered/speed post to Editor-In-Chief, Environment and Social Welfare Bulletin, India at Regional office, Godavaripuram, Bajrangnagar, Ward No. 31, Panna Road, Chhatarpur, Madhya Pradesh, India. PIN 471001.

Manuscript should be prepared by
Title,
Author(s) name,
Institutional address, Email ID, Mobile number,
Abstract,
Introduction,
Text matter,
Summary,
Recommendations,
References cited (reference pattern like Book title- Author name- Publisher- Printer-year of edition),
Figure and Table.
Articles may be of 1500 to 2000 words.

To share the responsibility of publication of manuscript the author(s) is advised to become the General Member of the ESWSociety at the time of submission of the article. Membership of the ESWSociety, Khajuraho is according to date of joining.

Authors are requested to submit only articles that have carefully proof reading and polished. Before submission please make sure that your article is prepared using the ESW Bulletin, India template may be downloaded by Website: http://www.godavariacademy.com

ESW Bulletin, India; biannual and bilingual is published in January and July online may be downloaded by Website: http://www.godavariacademy.com and Print copy may be obtained from Regional office of The ESWSociety,Chhatarpur by prior requesting to Editor-in-Chief. Address Editor-in-Chief, Environment and Social Welfare Society, Regional Office, Godavaripuram, Bajrangnagar, Ward No. 31, Chhatarpur, Madhya Pradesh, India. PIN 471001.

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Event Report

Environment and Social Welfare Society, Khajuraho-471606., and
Godavari Academy of Science & Technology, Chhatarpur 471001. India.

Object of The Environment and Social Welfare Society (ESW Society)

To establish, arrangement and management all around development in the field of Education and expension of educational institutions.
To develop Ideal morality, Character building in the Children according to Indian tradition and Culture.
All around development of the Children.
Arrange training programme to establish Self Employment Centre.
To organize Semianr for Environmental management, Pollution control, and establish Awareness centre for the same.
To make awareness for Social welfare. Check against Animal cruelty and to protect against cruelty and Tyrany. Open animal house for improvement of animal health and provid necessary facility for them.
To highlight modern Technology, Computer, Games & Sports, Music, Art, Literature, and various languages Hindi, English, Urdu, and other foreign languages in the field of Education.
Establish Research Centre.

Progress Report

Environment & Social Welfare Society, Khajuraho India (ESW Society) Environment and Social Welfare Society is the National Society of India. Now it's worldwide known by its impact. It has been to develop relationship between Environment and Society envisions the promotion of Education and Sciences among the University, College and School students as well as in the Society for Environment and Welfare. The main branches of ESW Society are **Godavari Academy of Science and Technology**, Chhatarpur. And **Godavari Fisheries Estate**, Fisheries Demonstration Centre, Nahdora-Khajuraho.

ESW Society is registered under the firms and society Act 1973, Government of Madhya Pradesh, India in 31 January 2000. It was affiliated on 25 November 2002 with registration number M815/Chhatarpur by Nehru Yuva Kendrya Sansthan, Yuva Kalyan avam Khel Mantralaya, Government of India. It also recognized by Madhya Pradesh Jan Abhiyan Parishad (Planning Department), Chhatarpur 471001, Government of Madhya Pradesh, India since 21 January 2013 with registration number 148.

Free Diabetes Camp

Object: to know position of Pancreatic disorder.
Environment & Social welfare Society conducted a Free Diabetes Camp for health monitoring at urban area Takshsila College, Chhatarpur District Chhatarpur and in rural area Village Arora, Tahseel Baldevgarh, District Tikamgarh MP. Organizing committee members were Dr. Ashwani Kumar Dubey, Dr. N. D. Agarwal, Shivendra Shukla and Rahul Tripathi. This programme is Co-ordinate by Rajendra Namdev. Special cares were taken by Dr. Rajendra Dixit, Vandana Dubey, Umasanker Bhargava and Mahesh Sahu. All samples were

analyzed by Dr. Ankita Khare MBBS Mahatma Gandhi Medical College, Indore, Dr. N. D. Agrawal, School of Studied in Biochemistry, Jiwaji University, Gwalior, Rajendra Namdev, Biotechnologist, Department of Biotechnology, Jiwaji University, Gwalior, , Atri Verma (DMLT) Chemist, Rani Pathak (ANM) Chemist,R & D, Godavari Academy of Science and Technology, Chhatarpur, and Roop Chand Patel Technician Thyo care, Chhatarpur.

Observation & Result
Arban Area, 90 samples were analyses on 30, October 2013 at Takshsila college.. The parameters were Habit related Smoking, Chewing tobaco, Fasting sugar, Post sugar, Blood pressure, Pulse, Height and Weight ratio, Hemoglobin and Blood Group observed. Values indicated that 10 % person regular smoked while 1.11 % using Chewing tobacco. 80.95 % person found Hyperglasmic whereas No Hypoglasmic person found.

Rural Area, 57 samples were analyses on 31, October 2013 at Rural area Village Arora, Tahseel Baldevgarh, District Tikamgarh. The parameters were Habit related Smoking, Chewing tobaco, Fasting sugar, Post sugar, Blood pressure, Pulse, Height and Weight ratio, Hemoglobin and Blood Group observed. Values indicated that 26.31 % person regular smoked while 8.77 % using Chewing tobacco. 48.71 % person found Hyperglasmic and 07.69 % hypoglasmic.

Conclusion Most of the person who are not aware that they are suffering from such type of disorder.

Recommendation Need to further monitoring in urban and rural area for pancreatic disorder in order to check Blood Pressure also and need to aware for Good Human Health in the Society.

A view of Diabetes Camp at Chhatarpur

A view of Pollution Control Awareness Program at Khajuraho. Dr. Ashwani K. Dubey with Dr. N. P. Shukla, Chairman MP Pollution Control Board, Bhopal

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Invitee Treatise (Section in English)

ECOSYSTEM APPROACH FOR MANAGEMENT OF PROTECTED AREAS AND THE "CONVENTION ON BIOLOGICAL DIVERSITY"

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Introduction

For more than a century, countries throughout the world have been setting aside areas for special protection because of their natural beauty and their repository status for important biodiversity. Protected areas are the cornerstones for in situ conservation of biological diversity. They have long been recognized as a key tool to counter the loss of the world's biodiversity. Over the last 40 years there has been a paradigm shift in the role of protected areas from 'national parks and reserves' to a broader conceptual and practical approach including sustainable use areas. Today, it is globally recognized that protected areas contribute, in addition to their conservation function, to human welfare, poverty alleviation and sustainable development. Their importance, ranging from conservation of biological diversity, storehouses of genetic materials, provision of essential ecosystem services for human welfare, and contribution to sustainable development, have been recognized at multiple levels, from international bodies to national governments, local groups, and communities. Globally, the number of protected areas has been increasing significantly over the last decade and there are now more than 100,000 protected sites worldwide covering about 12% of the earth's land surface, making them one of the earth's most significant land uses. However, while the number and size of protected areas have been increasing, biological diversity loss continues unabated. The existing global system of protected areas is inadequate in several ways: (i) they are incomplete and do not cover all biomes and critical species; (ii) they are not fulfilling their biodiversity conservation objectives; (iii) participation of local communities in establishment and management of protected areas is inadequate; and (iv) protected areas in developing countries are poorly funded.

Ecosystem Approach

Ecosystems are complex entities and comprise of interdependent and interacting biotic and abiotic components, which are linked by the transfer of energy and materials. Sustainability of any ecosystem depends on maintained conditions or on the resilience of organisms within changing conditions. An ecosystem is an interconnected community of living things, including humans, and the physical environment with which they interact. Ecosystem management is an approach to restoring and sustaining healthy ecosystems and their functions and values. It is based on a collaboratively developed vision of desired future ecosystem conditions that integrates ecological, economic, and social factors affecting a management unit defined by ecological, not political boundaries. Ecosystem management is an approach of restoring and sustaining healthy ecosystems, and their functions and values. Human interaction, biodiversity, and ecosystem dynamics are highly integrated, with components of biodiversity making up the dynamic elements expressed through ecosystem

processes. However, the present trends of economic development, supported by inappropriate financial incentives, typically under value the ecosystem processes and services leading to the over exploitation of valuable resources worldwide. Ecosystem-based management attempts to regulate our use of ecosystems so that we can benefit from them, while at the same time modifying our impacts on them so that basic ecosystem functions are preserved. The basic tenet is that conserving ecosystem functions and integrity will be, or should be, a fundamental vehicle for sustainable development. A central premise of ecosystem management is that the structural and functional integrity of the system should be maintained. The ecosystem-based management usually deals with sufficiently large spatial areas, whether they are regions, greater ecosystems or landscapes, that they are complex, interconnected and dynamic system.

Convention on Biological Diversity

The seventh meeting of the Conference of the Parties (COP) to the Convention on Biological Diversity (CBD) taking impetus provided by the Millennium Development Goals, the Plan of Implementation of the World Summit on Sustainable Development, the Durban Accord and the plan of action from the 5th World's Parks Congress, adopted a Programme of Work on protected areas. The programme of work represents the most comprehensive and specific protected area commitments ever made by the international community. The overall objective of the programme of work is to establish and maintain comprehensive, effectively managed and ecologically representative systems of protected areas that collectively, will reduce significantly the rate of loss of global biodiversity. This ultimate objective is to be achieved on land by 2010 and in marine areas by 2012. In the programme of work the COP set out detailed goals, targets and activities for meeting this ultimate objective. The COP made it clear that fully implementing the Programme of Work would require unprecedented international cooperation, including the provision of increased financial and technical resources to developing countries. An effective global protected area system is the best hope for conserving viable and representative areas of natural ecosystems, habitats and species, would and help to achieve the 2010 biodiversity target. In adopting the Programme of Work, the world community has agreed to work together at the national, regional and international level to meet clearly defined goals and time-bound targets for the world's protected areas.

Program of Work

This Action Guide to the Programme of Work on Protected Areas describes the targets and time frame, and provides an overview of potential steps, case studies, tools and resources for implementation. It contains four programme elements, i) Direct actions for planning, selecting, establishing, strengthening, and managing protected area systems and sites, ii) Governance, Participation, Equity and Benefit Sharing, iii) Enabling Activities, and iv) Standards, Assessment and Monitoring. The salient features of goals and the targets of the Programme of Work are as follows:

Goal 1.1 - To establish and strengthen national and regional systems of protected areas integrated into a global network as a contribution to globally agreed goals.

Target: By 2010 terrestrially and by 2012 in the marine area, a global network of comprehensive, representative and effectively managed national and regional protected area system is established as a contribution to (i) the goal of the Strategic Plan of the Convention and the World Summit on Sustainable Development of achieving a significant reduction in the rate of biodiversity loss by 2010, (ii) the Millennium Development Goals - particularly

goal 7 on ensuring environmental sustainability, and (iii) the Global Strategy for Plant Conservation.

Goal 1.2 -To integrate protected areas into broader land and seascapes, and sectors so as to maintain ecological structure and function.

Target: By 2015, all protected areas and protected area systems are integrated into the wider land and seascape, and relevant sectors by applying the ecosystem approach and taking into account ecological connectivity and the concept, where appropriate, of ecological networks.

Goal 1.3 - To establish and strengthen regional networks, transboundary protected areas (TBPAs) and collaboration between neighbouring protected areas across national boundaries.

Target: Establish and strengthen by 2010/ 2016 transboundary protected areas, other forms of collaboration between neighbouring protected areas across national boundaries and regional networks, to enhance the conservation and sustainable use of biological diversity, implementing the ecosystem approach, and improving international cooperation.

Goal 1.4 - To substantially improve site-based protected area planning and management

Target: All protected areas to have effective management in existence by 2012, using participatory and science based site planning processes that incorporate clear biodiversity objectives, targets, management strategies and monitoring programmes, drawing upon existing methodologies and a long-term management plan with active stakeholder involvement.

Goal 1.5 - To prevent and mitigate the negative impacts of key threats to protected areas

Target: By 2008, effective mechanisms for identifying and preventing, and/or mitigating the negative impacts of key threats to protected areas are in place.

Goal 2.2 - To enhance and secure involvement of indigenous and local communities and relevant stakeholders

Target: Full and effective participation by 2008, of indigenous and local communities, in full respect of their rights and recognition of their responsibilities, consistent with national law and applicable international obligations, and the participation of relevant stakeholders, in the management of existing, and the establishment and management of new, protected areas Programme of Work on Protected Areas.

Goal 3.1 - To provide an enabling policy, institutional and socio-economic environment for protected areas.

Target: By 2008, review and revise policies as appropriate, including use of social and economic valuation and incentives, to provide a supportive enabling environment for more effective establishment and management of protected areas and protected areas systems.

Goal 3.2 - To build capacity for the planning, establishment and management of protected areas

Target: By 2010 comprehensive capacity building programmes and initiatives are implemented to develop knowledge and skills at individual, community and institutional levels, and raise professional standards.

Goal 3.3 To develop, apply and transfer appropriate technologies for protected areas

Target: By 2010 the development, validation, and transfer of appropriate technologies and innovative approaches for the effective management of protected areas is substantially improved, taking into account decisions of the Conference of the Parties on technology transfer and cooperation.

Goal 3.4 To assess and monitor protected area status and trends

Target: By 2010, national and regional systems are established to enable effective monitoring of protected-area coverage, status and trends at national, regional and global scales, and to assist in evaluating progress in meeting global biodiversity targets.

The Chalanges of Ecosystem Approach of Management and the way ahead

The existence, variety and perhaps ubiquity of obstacles to ecosystem-based management and other integrative activities such as integrated resource management are well known. The following issues are pretty typical; many of these problems plague most efforts at integrated or ecosystem-based, environmental management. i) fragmentation and specialization in administration and research; ii.) competition within and between agencies and governments; iii.) arbitrary, politically defined management units; a structural and functional orientation; short-term, local and self-interested policies, and economic determinism; obscure terms and goals such as sustainability and integrity; top-down planning and management processes; and poor use of existing information.

A strong and effective protected areas system need to be supported by appropriate policies, legal instruments and institutions. The Programme of Work aims at sensitizing countries to understand the true value of protected areas and to provide more supportive policy environments. Many protected areas are yet to develop the associated human and material resources needed for effective management and therefore capacity building has been highlighted in the Programme of Work. Capacity building in form of formal training, informal exchanges and collaboration, and moregeneral educational efforts need to be a priority. Protected areas only work as conservation tools if they are managed effectively to maintain their values in perpetuity. Three important steps in addressing management effectiveness would be ; i) identifying an agreed set of standards for a protected area or a national protected areas system; ii) developing and applying systems for evaluating management effectiveness, thus helping to identify necessary changes (adaptive management); and iii) establishing systems to monitor the status and trends of protected areas and their biodiversity. Good protected area management needs a good basis of knowledge about biodiversity, environmental services, social issues and management strategies. Although protected areas are perhaps the world's most important resource in terms of building ecological knowledge, much of the current research that takes place in protected areas is not translated into information that is of use to managers. The Programme of Work suggests some steps to address these problems. It is difficult to sum up what is necessary to implement ecosystem-based management or, more importantly, what is necessary to make it work. On the one hand, it encompasses so many issues and components, and on the other, it varies so much from site to site.

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Contributory Article (Section in English)

HOME SOLAR POWER SYSTEM

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Introduction

Sun is the Source of all energy on the earth. It is most abundant, inexhaustible and universal source of energy. AH other sources of energy draw their strength from the sun. India is leased with plenty of solar energy because most parts of the country receive bright sunshine throughout the year except a brief monsoon period. India has developed technology to use energy for cooking, water heating, water dissimilation and other electrical appliances.

Text Matter

Solar photovoltaic system or **solar power system** is one of **renewable energy system** which uses PV modules to convert sunlight into electricity. The electricity generated can be stored or used directly, fed back into grid line or combined with one or more other electricity generators or more renewable energy source. Solar PV system is very reliable and clean source of electricity that can suit a wide range of applications such as residence, industry, agriculture, livestock, etc. A solar cell is a unit of solar power system.

A **solar cell** (also called a **photovoltaic cell**) is an device that convert the energy of light directly into electricity by the photovoltaic effect. It is a form of **photovoltaic cell** (in that its electrical characteristics-e.g. current, voltage, or resistance – vary when light is incident upon it) which, when exposed to light, can generate and support an electric current without being attached to any external voltage source.

The term "photovoltaic" comes from the Greek word "Phos" meaning "light", and from "volt" , the unit of electro-motive force, the volt, which in turn comes from the last name of the Italian physicist Alessandro Volta, inventor of the battery.

A **solar panel** (also **solar module, photovoltaic module** or **photovoltaic panel**) is a packaged, connected assembly of **photovoltaic cell**. The solar panel can be used as a component of a larger photovoltaic system to generate and supply electricity in commercial and residential application. Each panel is rated by its DC output power under standard test condition, and typically ranges from 100 to 320 watts. The efficiency of a panel determines the area of a panel give the same rated output – an 8% efficient 230 watt panel will have twice the area of a 16% efficient 230 watt panel. Because a single solar panel can produce only a limited amount of power, most installation contains multiple panels.

Solar PV system includes different components that should be selected according to your system type, site location and applications. The major components for solar PV system are solar charge controller, inverter, battery bank, auxiliary energy sources and loads (appliacnes).

- **PV module –** converts sunlight into DC electricity.
- **Solar charge controller –** regulates the voltage and current coming

from the PV panels going to battery and prevents battery overchaging and prolongs the battery life .

- **Inverter –** converts DC output of PV panels or wind turbine into a clean AC Current for AC application or fed back into grid line.
- **Battery –** stores energy for supplying to electrical appliances when there is a Demand.
- **Load –** is electrical appliances that connected to solar PV system such as lights, radio, TV, Computer, refrigerator etc.
- **Auxiliary energy sources –** is diesel generator or other renewable energy sources.

Solar PV System sizing

1. **Determine power consumption demonds**

The first step in designing a solar PV system is to find out the total power and energy consumption of all loads that need to be supplied by the solar PV system as follows:

1.1– calculate total watt-hours per day for each appliance used.
Add the watt-hours needed for appliances together to get the total watt-hours per day which must be delivered to the appliances.
1-2 – calculate total watt-hours per needed from the PV modules.
Multiply the total appliances watt-hours per day times 1.3 (the energy lost in the system) to get total watt-hours per day which must be provided by the panels.

2. **Size the PV modules**

Different size of PV modules will produce different amount of power. To find out the sizing of PV module, the total peak watt produced needs. The peak watt (wp) produced depends on size of the PV module and climate of size location. We have to consider "panel generation factor" which is different in each site location. For Thailand, the panel generation factor is 3.34 . To determine the sizing of PV modules, calculate as follows.

2.1 – calculate the total watt-peak rating needed for PV modules
Divide the total watt-hours per day needed from the PV modules (from item 1.2) by 3.43 to get the
total watt-peak rating needed for the PV panels needed to operate the appliances.

2.2 – Divide the answer obtained in item 2.1 by the rated output watt-peak of the PV module available to you. Increas any fractional part of result to the next highest full number and that will be the number of PV modules required . Result of the calculation is the minimum number of PV panels. If more PV modules are insalled, the system will perform better and battery life will be improved. If fewer PV modules are used, the system may not work at all during cloudy periods and battery life will be shortened.

3 **– Inverter Sizing**

An inverter is used in the system where AC power output is needed. The input rating of the inverter should never be lower then the total watt of appliances. The inverter

must have the same nominal voltage as your battery. For stand-alone systems, the inverter size should be 25-30% bigger then total watt of appliances. In case of appliance type is motor or compressor then inverter size should be minimum 3 times the capacity of those appliances and must be added to the inverter capacity to handle surge current during starting. For grid tie systems or grid connected systems, the input rating of the inverter should be same as PV array rating to allow for safe and efficient operation.

4 – Battery Sizing

The battery type recommended for using in solar PV system is deep cycle battery. Deep cycle battery is specifically designed for to be discharged to low energy level and rapid recharged or cycle charged and discharged day after day for years. The battery should be large enough to store sufficient energy to operate the appliances at night and cloudy days. To find out the size of battery, calculate as follows;

4.1- Calculate total watt-hours per day used by appliances.

4.2- Divide the total watt-hours per day used by 0.85 for battery loss.

4.3- Divide the answer obtained in item 4.2 by 0.6 for depth of discharge.

4.4- Divide the answer obtained in item 4.3 by the nominal battery voltage.

4.5- Multiply the answer obtained in item 4.4 with day of autonomy (the number of days that you need the system to operate when there is no power produced by PV panels) to get the required Amprer-hour capacity of deep-cycle battery

$$\text{Battery Capacity (AH)} = \frac{\text{Total Watt-hours per day used by appliance X Days of autonomy}}{(0.85 \times 0.6 \times \text{nominal battery voltage})}$$

5. Solar charge controller sizing

The Solar charge controller is typically rated against Amperage and Voltage capacities. Select the solar charge controller to match the voltage of PV array and batteries and then identify which type of solar charge controller is right for your application. Make sure that solar charge controller has enough capacity to handle the current from PV array .

For the series charge controller type, the sizing of controller depends on the total PV input current which is delivered to the controller and also depend on PV panel configuration (series or parallel configuration).

Accourding to standard practice, the sizing of solar charge controller is to take the short circuit current (Isc) of the PV array, and multiply it by 1.3

Solar charge controller rating = Total short circuit current of PV array X 1.3

Remark: For MPPT charge controller sizing will be different .(See Basics of MPPT charge controller)

Examlpe: A hours has the following electrical appliance usage :

- One 18 Watt fluorescent lamp with electronic ballast used 4 hours per day.
- One 60 Watt fan used for 2 hours per day .
- One 75 Watt refrigerator that runs 24 hours per day with compressor run 12 Hours and off 12 hours .

The system will be poewred by 12 Vdc, 110 Wp PV module .

1- Determine power consumption demonds

Total application use = (18 W x 4 hours) + (60 W x 2 hours) + (75 W x 24 x0.5 hours) = 1092 Wh/day .

Total PV panels energy needed = 1092 x 1.3

= 1419.6 Wh/day .

2- Size the PV panel

2.1 Total Wp of PV panel capacity needed = 1419.6 / 3.4

= 413.9 Wp

Number of PV panel needed = 413.9 / 110

= 3.76 modules

Actual requirement = 4 modules

So this system should be powered by at least 4 modules of 110 Wp PV module .

3- Interter sizing

Total Watt of all appliance = 18 + 60 + 75 = 153 W

For safety, the inverter should be considered 25-30% bigger size.

The inverter size should be about 190 W or greater.

4- Battery sizing

Total appliance use =

(18 W X 4 hours) + (60 W X 12 hours) + (75 W X 12 hours)

Nominal battery voltage = 12 V

Days of autonomy = 3 days

$$\text{Battery capacity} = \frac{(18\text{ W} \times 4\text{ hour}) + (60\text{ W} \times 12\text{ hours}) + (75\text{ W} \times 12\text{ hours}) \times 3}{(0.85 \times 0.6 \times 12)}$$

Total Ampere – hours required 535.29 Ah

So the battery should be rated 12 V 600 Ah for 3 day autonomy.

5- Solar charge controller sizing

PV module specification

PM = 110 Wp

Vm = 16.7 Vdc

Im = 6.6 A

Voc = 20.7 A

Isc = 7.5 A

Solar charge controller rating = (4 Strings x 7.5 A) x 1.3..= 39 A So the solar charge controller should be rated 40 A at 12 V or greater.

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Contributory Article (Section in English)

BIODIVERSITY AND FOREST CONSERVATION OF GOA, INDIA

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Introduction

Forests are one of the most vital natural resources for mankind on earth since ancientperiod. 60% of the earth was once covered with forests. With the development of civilization, large areas have been cleared to make way for farms, mines, towns and roads. Today about 30% of the earth is still forested.Thus, on priority basis conservation of forests is veryessential now a day. Forests are always very precious for us because they make available us with enormous amounts of noticeable and elusiveprofits, without which human cannot survive. Thus, for the survival of human beings, a universalattitude is mandatory to be accepted towards a sustainable system to preserve forests and come acrossto our needs at the same time so as toconjointlyadvantageous co-existence of all.

India is one of the twelve mega biodiversity regions of the world. Its land area contains regions with some of the world's highest rainfall to very dry deserts, coast line to alpine regions, river deltas to tropical islands. The variety and distribution of forest vegetation in India is very huge. Indian forests types comprise tropical evergreens, tropical deciduous, swamps, mangroves, sub-tropical, montane, scrub, sub-alpine and alpine forests. These forests are sustenance a variety of ecosystems with diverse flora and fauna.

Forest found in Goa

Like other forests of India, Goa state forests also play a major role in enhancing the quality of our environment, influencing local and global climate as well as contribute substantially to the social and economic development of the country. The protected areas of Goa are situated along the green Western Ghats which are one of the richest reservoirs of biodiversity in the world. In the February 1999 issue of *National Geographic Magazine*, Goa was compared with the Amazon and Congo basins for its rich tropical biodiversity. Equatorial forest cover in Goa stands at 1,424 km^2 (549.81 sq m.). Most of the forests in the state are located in the interior eastern regions of the state. Goa has more than 33% of its geographic area under government forests of which about 62% has been brought under Protected Areas (PA) of Wildlife Sanctuaries and National Park. The section that lie within Goa (the Sahyadris) and which dominates its ecosystem readily reflects its enigmaticdensity in plants, animals and birds.Goa's wildlife sanctuaries have of more than 1512 species of plants, over 275 species of birds, over 48 kinds of animals and over 60 genera of reptiles.

Estuarine vegetation of mangroves along swampy river banks occurs in isolated small patches along the banks of Mandovi and Zuari rivers and other salt water streams. Botanically this

zone is characterized by peculiar root formations (stilt roots of *Rhizophora, pneumatophores* in *Avicennia*, knee root in*Bruguiera* etc). The mangroves are found in the division mainly at Durbhat, Panaji, Agassaim and Cortalim. Most of the coastal regions of Goa are rocky with projecting ridges. The strand vegetation is limited to a few patches of narrow strip bordering the Arabian Sea. The vegetation along the south bank of the river Mandovi near Panajigoes to constituent vegetation. Tree species mainly found are*Pongamiapinnata, Thespesiapupulnea, Calophylluminophyllum, Cerberamanghas and Pandanustectorius.* Many herbaceous species such as*Neanotisrheedei, lphigeniaindica, Begonia crenata, Mitreolaoldenlandioides, Habenariagrandifloriformis, Tricholepisglaberrima, Trichidesma sp*. are also found along rocky creeks and projecting ridges facing the coast.A major portion of the vegetation in Goa belongs to Plateau vegetation along undulating terrain and hills, which is divided into Open Scurb jungle and Moist deciduous forests.Open scrub jungle occurs from Panaji to Cortalim and from Bicholim to Sanquelim. *Anacardiumoccidentale* is found on an extensive scale. The vegetation is mainly composed of dry deciduous elements such as *Carissa congesta, Hollarrhenapubescens, Lantana camara, Calycopteris floribunda, Woodfordiafruticosa, Grewiaabutilifolia, Vitexnegundo and species of Calotropis, Ziziphus, Cassia, Ixora, Acacia, Albizia, Terminalia and Crotalaria.*The main forest type of Goa is moist mixed deciduous forests, which covers more than half of the forest areas. In North Goa Division, this type occurs around Tudal,Ordofind, Butpal, Molem, Codal, AbicheGol near Valpoi, and Anmodeghat. Predominant species are *Terminaliacrenulata, T. belerica, T. paniculata, Lagerstroemia parviflora, Adina cordifolia, Albizialebbeck, A. procera, Mitragynaparvifolia, Holopteliaintegrifolia, Trewianudiflora, Dilleniapentagyna, Semicarpusanacardium, Mallotusphilippensis and Stereospermumcolais.* Sub-tropical Hill forests are also specific type of forests found in Goa which have formed due to "Kumeri" cultivation in the past. In these forests *Syzygiumcuminii, Cinnamomumverum, Caryotaurens, Carviacallosa (Strobilanthescallosus), Elaeagnusconferta and Capparis spp.* are of commonly occurred.

Semi-evergreen forests also occur in Goawith intermixing between tropical evergreen and moist deciduous forest mostly above 500 m.s.l. Basically, these are found at Ambochegol, Molem, Butpal and Nadquem. *Artocarpushirsutus, A. gomezianus, Calophyllum spp., Sterculiaguttata, Kydiacalycina, Lagerstroemia microcarpa, Pterospermumdiversifolium, Garciniaindica, Diospyros Montana and Macrangapeltata are common s*pecies found in these types of forests.

Lateritic Semi-evergreen forests are found on shallow dry lateritic soils in Goa. *Xyliaxylocarpa* is the prominent tree species with other companions like, *Pterocarpusmarsupium, Grewiatiliifolia, Terminaliapaniculata, Schleicheraoleosa, Careyaarborea,Brideliaretusa and Strychnosnux-vomica.* Evergreen forests occur in deep gorges and depressions and also along the nallahs and streams in the Ponda-Amboli-Rambhat belt. The main species are *Calophyllumcalaba, Garciniagummi-gutta, Canariumstrictum, Lophopetalumwightianum, Myristicaspp., Knemaattenuata, Chroisophyllumacuminata, Palaquiumellipticum, Artocarpusgomezians, Diospyrusebenum, Mangiferaindica, Persea Macrantha, Mimusopselengi, Hopeaponga, Oleadioica, Hydnocarpuspentendra, Syzygiumcumini, Holigarnaarnotiana, Litseacoriacea, Carallia, brachiata,*

Mallotusphilipprnsis, Ficusspp. etc. The magnificent rare fernnamed *Osmundaregilis* is also found in Goan forest.

Forest Conservation in Goa

Forests should be properly managed and looked after. For this purpose, the National Forest Policy, 1988 is also envisaged in Goa with the co-operation of the local people in the conservation and the development of forests. In view of the principles laid down by the Government of India, the Government of Goa has decided to get people's co-operation in areas considered sensitive from the point of view of forest protection and approved the scheme of Joint Forest Management in the state vide Notification No. 12-2-2001-02/FD/894 dated 6th March,2003. Many other developmental schemes are taken up annually by the Forest Department of Goa. A large number of seedlings are elevated by the Forest department to meet its own demand for planting and to supply to prospective tree growers i.e. individuals, corporations, etc. On special occasions like Vanamahotsava, Environment Day, Wildlife Week etc. seedlings are distributed free of cost. Institutions like Panchayats, Schools, Churches, Devasthans etc. also are supplied with seedlings during the monsoon season free of cost.Bringing barren areas under tree cover is one of the most important mandate of the forest department. This is achieved through a number of schemes like Rehabilitation of Degraded Forests under the Capital outlay, Forest Plantation under the Western Ghats Outlay, Social Forestry and NTFP plantations under the Revenue outlay. The department constructs minor engineering structures to physically arrest soil loss. Such structures are invariably supported by vegetative measures like plantation of trees, agaves and other plants with soil binding properties. The more popular structures are Gully Plugs, Small Check Dams, Medium Check dams, Gabions, Bandharas etc. The Department undertakes the development of Parks and Gardens in cities/towns and roadside plantations.Watch Towers were constructed in sensitive areas to keep control over poaching, illicit felling and forest fires. Medicinal Plants like Patchouli *(Pogostemom cablin),* Pipli *(Piper Longum),* Sarpagandha *(Rauvolfiaserpentina),*Aloe *(Aloebarbedonsis),*Kokum*(Garniciaindica) are also planted by* Research and Utilization Division of Goa. In addition of plantation, the Wildlife Rescue Group conducts rescue operation for wild animals, which have strayed into human habitations.Mining is one of the most important economic activities in the State of Goa. The timid area of forests is affected due to mining that is the non-forest activity, so the approval of the central government is required under the Forest Conservation Act.In addition to mining activities, other developmental activities for which forest land has been diverted under Forest Conservation Act are drawing power lines, road construction, irrigation and others. In spite of all these afforesting activities, Goa forest department is managing the conservation of forest by following the rules of National Forest Policy, 1988.

In Goa, indiscriminate deforestation is prohibited and pests and diseases of the forest trees are controlled chemically and biologically. Many programmes related to re-forestation, social forestry, urban forestry, production plantation, reserve forests are conducted. For

conservation of forests of Goa, felling of trees and grazing of cattle are prohibited in these forests.A special function of tree plantation, Van Mahotsava, is held each year in February and July. Many International agencies like World Bank, US Agency for International Development (USAID) Canadian International Development authority (CIDA) and Swedish International Development Authority (SIDA) give support for promoting afforestation Programmes in Goa.

Conclusion

Proper management and sustainable development of the forest zone of Goa is an important issue. In view of various problems and impacts on forests, it is being carried out an environmental impact assessment of the effects of human activity on the forest ecosystems of the entire Goa in time to time. The important forests products of Goa are coconut, areca, cashew, bamboo canes, Maratha barks, chillar barks and the bhirand which affect the economy of Goa. Goa has many famous National Parks, including the renowned Salim Ali bird sanctuary. Other wildlife sanctuaries include the Bondla Wildlife Sanctuary, MolemWildlife Sanctuary, Cotigao Wildlife Sanctuary, Madei Wildlife Sanctuary, Netravali Wildlife Sanctuary, Mahaveer Wildlife Sanctuary and the Salim Ali Bird Sanctuary. These special forest activities, forest products and specific forestry of Goa stand it on the unique position of Goa state among the country.

References

1. http://www.goaforest.com/forestmgmt_achvmnts.htm
2. Ecological Traditions of Goa (2008), ISBN-978-81-86901-14-4, ENVIS Centre at CPREES at Goa.
3. http://www.britannica.com/EBchecked/topic/236436/Goa

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Contributory Article (Section in English)

Biodiversity: The Source of Life

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Abstract
The ecological consequences of biodiversity loss have aroused considerable interest and controversy during the past decade. Major advances have been made in describing the relationship between species diversity and ecosystem processes, in identifying functionally important species, and in revealing underlying mechanisms. There is, however, uncertainty as to how results obtained in recent experiments scale up to landscape and regional levels and generalize across ecosystem types and processes. Larger numbers of species are probably needed to reduce temporal variability in ecosystem processes in changing environments. A major future challenge is to determine how biodiversity dynamics, ecosystem processes, and abiotic factors interact.

Introduction
In our modern world, there is a fact that nobody can escape: we are in trouble and if we do not change things, nobody will. We worry about global warming, poverty, hunger, healthcare, but we neglect one main problem. This problem exists, but nobody sees it. Slowly but surely, our world is dying. Species by species, life is disappearing because of us. Humans have to understand that in order to secure our future in this planet we must first help those that are in trouble because of our greed and unsustainability. Biodiversity is a main factor in the sustenance and development of the world and human society. The loss of biodiversity is imminent-if no change is made in the next 35 years,half of the world's species will disappear-and its decrease will be a decisive factor in our planet's future (Williams,Scott et al.).

According to the United Nations Environmental Program (UNEP), biodiversity is the variety of all forms of life, including genes, species, populations and ecosystems (Kasten, Liu et al.). Biodiversity contains every living thing, including humans. It works in an interdependent system, a web of sorts. Every being depends on each other to survive. If one being disappears, the web is weakened, but because there is balance, it remains in place (Williams, Scott, et al.). One example of this interdependency is the Nitrogen Cycle. In the cycle, nitrogen is placed in the soil by bacteria. Plants then use nitrogen to grow into mature, fruit-bearing organisms. Finally, animals and humans eat plants; consequently their droppings feed bacteria, which renew the cycle by placing nitrogen in the ground. Another well-known example is the relationship between bees and flowers. Bees need flowers to get their food, pollen, while flowering plants need bees to pollinate them in order to reproduce the next generation of flowers. Humans are an influential part of the web of biodiversity, because they have the potential to destroy the web entirely or to keep it in balance. This means that in this sense, we have control over ourselves because the web of biodiversity depends on us, but we depend on the web as well (Shah). The Convention on Biological Diversity proudly displays this truth in their slogan, "Biodiversity is life; biodiversity is our life."

Biodiversity source of Life

Our planet, the shared environment between humans and all life, directly depends on the variety of life existing on it and the services and goods it provides. According to the World Wildlife Fund (WWF), the cost of replacing one year's worth of what nature freely provides us is 33 trillion dollars ("How does biodiversity"). Biodiversity provides us with many services essential for our survival. The United Nations Environmental Program (UNEP) groups these services into regulating and supporting services (Kasten, Liu, et al.). The regulating services include protection of water sources, pollution breakdown and absorption, stabilization of climate, and control of diseases. Water is protected and filtered by various plant species that play an active role in the water cycle and by bacteria that break down chemicals and toxins that flow into bodies of water. Plants also have a great effect in reducing greenhouse gases, thus limiting air pollution (Shah). A recent study by UNEP titled "Integrated Solutions for Biodiversity, Climate Change and Poverty" confirms that biodiversity is at the base of climate regulation because biodiversity is the foundation of any climate zone (Kasten, Liu et al.). Biodiversity also helps control diseases because it has been proved that when an organism—in this case a bacteria or virus— outgrows its environment, nature never fails to create conditions that will reduce this organism's numbers (Shah). These regulating services are essential to our life.

The supporting services provided by biodiversity include soil formation and protection, nutrient cycles, and disaster recovery. Soil formation is possible because of a variety of life, including plants that break down rocks with their roots; bacteria, fungi, and protists that decompose waste into nutrients; and earthworms that provide drainage, structure and aerage to soil. All nutrient cycles are carried out by small organisms such as bacteria and fungi. Some well-known cycles are the nitrogen cycle and the decomposition of dead and decaying matter. The service of disaster recovery is also very important and it is carried out by living organisms such as plants that absorb floodwater, small organisms that decompose dead species, and all the species that accelerate the above-mentioned services until normalcy is reacquired (Shah).

Aside from these services, biodiversity also provides us with many resources imperatively necessary for our survival. Food is provided for us in the form of plants, animals, and fungi. Plants never fail to create oxygen, which is essential for human life as well as most other life forms. Medicine, from the most rustic to the most sophisticated, is obtained from all kinds of organisms like plants, fungi, bacteria and animals. Wood, a building material and the key element in fire making, is generously given to us by plant species. The large diversity of genes existing in our planet's biodiversity is an inexhaustible resource that can be used to fight diseases and improve our life styles. After mentioning all the services and resources biodiversity provides us, it is important to highlight that we should also include the goods and services we will receive in the future when more discoveries are made about the benefits other species can have in our lives (Shah).

Biodiversity is not only necessary for our environment and our biological survival, but for our social and cultural patterns. Biodiversity provides jobs in many areas, ranging from lower skill jobs, like farming, fishing and woodcutting, to higher skill careers, such as biological

and genetic engineering. According to the European Union, 35% of jobs in developing countries are derived from biodiversity and the goods it provides us. In first-world countries, 7% percent of jobs come from biodiversity ("Social Aspects"). UNEP said, "Collectively, the interactions of all the components that make up global diversity set the foundation on which human society has evolved." (Kasten, Liu et al.).This means that because humans developed amongst nature, human civilization and society co-evolved with the environment, and many aspects were dictated by the kind of environment the population faced while developing. It is this historical background what makes biodiversity have such great cultural value to every human. In education, biodiversity is important because it enforces values like respect, balance, and the fact that they are only a small part of an interdependent Earth. The esthetically pleasing quality of biodiversity and ecosystems gives a sense of spiritual well-being to people in urbanized areas, where the constant noise and monotonous landscape can quickly become tedious. Historically and in modern times, many aboriginal groups have had tribal cultural identities based on biodiversity. Modern countries also have a national plant, flower, and bird, and artists of all times have drawn inspiration from nature. Mother Nature has always inspired philosophical principles and in some cases religions, such as Taoism and Daoism. Recreational benefits are also received from biodiversity, like pets, flowers, camping, and trekking ("Cultural Values"). Culture is an essential part of any human civilization, and thanks to biodiversity, we have our own.

"Human health is strongly linked to the health of ecosystems, which meet many of our most critical needs," says Maria Neira, Director of the World Health Organization's Department for the Protection of Human Environment ("How does biodiversity"). And although people never fail to thank our planet for all it provides us for free, we also never fail to harm our planet more and more. In the Amazon rainforest, where 22% of all plant species live, one and one-half acres of forestland are destroyed and lost forever every second (Williams, Scott et al.). Species are becoming extinct quickly, and even though some say it is caused by a sixth natural extinction crisis, the real extinction catalyst is human society ("How many species"). The current rate of extinction—that is, the amount of extinctions per year—is a thousand times greater than what the normal extinction rate would be if humans did not exist (Williams, Scott et al.). Although the exact number of yearly extinctions cannot be known, the World Wildlife Fund (WWF) estimates that ten thousand species disappear each year ("How many species"). According to several college studies, if no change is made to current human living arrangements, half of all species will disappear in the next 35 years. This fact means that two-thirds of all birds, one-eighth of all plants, one-fourth of all mammals, one-fourth of all amphibians and one-fifth of all reptiles will be lost. This year alone, eleven thousand known species are endangered or near extinction because of human overconsumption and greed (Williams, Scott et al.).

To solve the problem of the loss of biodiversity, a wide range of actions must take place. Like every problem any individual faces, the first step is to educate oneself about the issue. The European Union and UNEP both recognize that people should be aware of the benefits biodiversity provides, as well as the problems that can arise when a sufficient biodiversity is lacking. The main point of this educational process is to create individual responsibility in every person so that they can take an active role in saving our planet's life source ("Social Aspects"; Kasten, Liu et al.). The following step is to support the regional organizations, such

as the WWF and the Convention on Biological Diversity (CBD), that have already started taking measures to ensure our planet's life does not end ("Social Aspects"). The next step, which might seem the most radical, yet the most effective, is to change the focus of our economic models to one that fully values the environment and all that it can provide for us (Kasten, Liu et al.). The key is to balance world needs with the environmental stability of our planet. While some may say that these measures are too dramatic and that the solution is simply protecting the forms of life that are essential to our survival, the real answer is to protect all life because life is interdependent. Failure to protect one species means the endangerment of all the species directly and indirectly connected to that one species (Williams, Scott et al.). The Convention on Biological Diversity (CBD) recommends the following solutions to ensure the survival of all life: establishing protected areas while promoting environmentally friendly development; rehabilitating degraded ecosystems with participation of local peoples; preventing the introduction of new species into established ecosystems because this creates an upset to nature's balance; and securing that new technology does not pose risks to the environment in any way ("Action for Biodiversity"). All solutions directed towards solving the problem of biodiversity have been provided; the next step is to act.

Conclusion

The source of all life, life itself, is dying. And we are letting it happen. We understand the importance of biodiversity, we understand what will happen if it continues decreasing, and we understand how to solve the problem. All we need to do is act. We have to save our planet from destruction and our equals from destroying what belongs to everyone. Rachel Carson, pioneer of the environmental awareness movement, once said, "Can any civilization wage relentless war on life without destroying itself and without losing the right to be called civilized?" ("Endangered Species Act"). Human civilization should and will create an answer to that question. The answer will be: "No, we will never let our own race destroy itself out of greed and carelessness again."

References

1. "Action for Biodiversity" Convention *on Biological Diversity (CBD).* Apr. 2010. 14 Feb. 2013.
2. "Cultural Values." *Coastlearn.* Sep. 2010. 18 Feb. 2013
3. "The Endangered Species Act." Macalester College. Jun. 2006. 21 Feb. 2013.
4. "How does biodiversity loss affect me and everyone else?" *WWF.* 14 Feb. 2013.
5. "How many species are we losing?" *WWF.* 14 Feb. 2013.
6. Kasten, Liu et al. "Integrated Solutions for Biodiversity, Climate Change and Poverty." *United Nations Environmental Program (UNEP).* Jan. 2010. 6 Feb. 2013.
7. Shah, Anup. "Why is Biodiversity important? Who Cares?" *Global Issues.* Apr. 2011. 31 Jan. 2013
8. Social Aspects of Biodiversity: creating jobs and sustaining people." *European Union.* Dec. 2011. 31 Jan. 2013.
9. Williams, Scott, et al. "Biodiversity Loss." *Biodiversity and Economics* Apr. 2010. 6 Feb. 2013.

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Contributory Article (Section in English)

Biosafety Overview: What You Need to Know WhenWorking With Biological Material

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Abstract

The critical aspects of biosafety, biosecurity, and biocontainment have been in the spotlight in recent years. There have also been increased international efforts to improve awareness of modern practices and concerns with regard to the safe pursuit of life sciences research, and to optimize current oversight frameworks, thereby resulting in decreased risk of terrorist/malevolent acquisition of deadly pathogens or accidental release of a biological agent, and increased safety of laboratory workers. Our purpose is to highlight how the World Health Organization's (WHO) revised International Health Regulations (IHR[2005]), the Biological Weapons Convention (BWC), and the United Nations Security Council Resolution (UNSCR) 1540 overlap in their requirements with regard to biosafety and biosecurity in order to improve the understanding of practitioners and policymakers and maximize the use of national resources employed to comply with internationally-mandated requirements. The broad range of goals of these international instruments, which are linked by the common thread of biosafety and biosecurity, highlight their significance as essential pillars of international health security and cross-cutting elements of biological nonproliferation. The current efforts of the Republic of Georgia to enhance biosafety and biosecurity in accordance with these international instruments are summarized.

Introduction

Applications of biotechnology are on the verge of great expansion in this decade. The production and release of the resulting Genetically Engineered organisms (GEOs) have raised concern about possible risks to human and to the environment.Accordingly, all biotechnology research has to be carried within a Regulatory biosafety.Biotechnology refers to any technique that uses living organisms or substances from these organisms to modify or

improve quality and product of crops and food, drugs and health care products, vaccines, industrial chemicals and its products.

It consists of gradient of technologies ranging from the widely used techniques of traditional biotechnology through modern biotechnology which is based on the use of new techniques of Recombinant DNA (r- DNA) technology, known as Genetic Engineering.

Principles of biosafety

To protect:

- the patient
- yourself
- the environment

What is Biosafety?

- Biosafety is one term that is used to describe the policies and procedures adopted to ensure the environmentally safe application of modem biotechnology.
- It is a term that is gaining wider currency as more countries seek to benefit from the application of modern science in agriculture, medicine, and the environment, without endangering public health or environmental safety.

Four Levels of Biosafety

- **BSL 1:** Material not known to consistently cause disease in healthy adults.
- **BSL 2:** Associated with human disease. Hazard is from percutaneous injury, ingestion, or mucous membrane exposure.
- **BSL 3:** Indigenous or exotic agents with potential for aerosol transmission; disease may have serious or lethal consequences.
- **BSL 4**: Dangerous/exotic agents which pose a high risk of life-threatening disease, aerosol-transmitted lab infections or related agents with unknown risk of transmission.

Risk Assessment

- Pathogenicity of material – disease incidence and severity
- Routes of Transmission – parenteral, airborne or ingestion
- Agent Stability – ease of decontamination
- Infectious Dose – LD50
- Concentration – infectious organisms/vol. & working volume

- Origin of material - Wild Type, exotic, primary cells
- Availability of effective prophylaxis – Hep. B vaccine
- Medical surveillance – exposure management
- Skill level of staff
- Risk of Activity – same agent can have different containment levels at different stages of protocol:
  - Procedures that produce aerosols have higher risk
  - Procedures using needles or other sharps have higher risk
  - Handling blood, serum or tissue samples may have lower risk
  - Purified cultures or cell concentrates may have higher risk
  - Larger volumes (10 L) have higher risk

Primary Containment

- Lab practices – standard lab practice, limited access, biohazard warning sign, sharps/needle precautions, SOPs for decon, waste, medicals.
- Safety equipment – biosafety cabinets (BSC), sharps containers, sealed rotors.
- Personal protective equipment (PPE) – lab coat, gloves, goggles.
- Host-vector for rDNA

Aerosol Precautions

- Use BSC for all procedures that may generate aerosols.
- Use centrifuges with biosafety covers.
- Do not use a syringe for mixing infectious fluids.
- Cultures, tissues, specimens of body fluids, etc., are placed in a container with a cover that prevents leakage during collection, handling, processing, storage, transport or shipping.

Needle and Sharps Precautions

- Precautions are for any contaminated sharp item, including needles and syringes, slides, pipettes, capillary tubes, and scalpels.
- Plastic ware should be substituted for glassware whenever possible.

- Needles and syringes or other sharp instruments should be restricted to parenteral injection, phlebotomy, or aspiration of fluids from laboratory animals and diaphragm bottles.
- Only needle-locking syringes or disposable syringe-needle units (i.e., needle is integral to the syringe) are used for injection or aspiration of infectious materials.
- Syringes which re-sheathe the needle, needleless systems, and other safety devices are used when appropriate.
- Used disposable needles must not be bent, sheared, broken, recapped, removed from disposable syringes, or otherwise manipulated by hand before disposal. Dispose in puncture-resistant containers which must be located near work.
- Non-disposable sharps must be placed in a hard-walled container for transport to a processing area for decontamination, preferably by autoclaving.
- Broken glassware must not be handled directly by hand. Pick up by mechanical means such as a brush and dustpan, tongs, or forceps.

Human Blood, Tissue and Fluid
Occupational Exposure to Blood borne Pathogens
Occupational Safety & Health Administration (OSHA) 29 CFR 1910.1030

- Use BSL 2 work practices and procedures.
- Additional requirements for HIV work.
- Everyone needs to be offered the Hepatitis B vaccine.
- Develop specific exposure plan SOPs.
- Specific training is required.
- Review needle/syringe use and replace with “safe” devices.
- Exposure incidents must be followed up.

Toxins

- Use BSL 2 work practices and procedures. See BMBL, Appendix I for specific requirements.
- Develop a Chemical Hygiene Plan specific to the toxin used. Include containment (fume hoods, biosafety cabinets), PPE, spill management, exposure and accident response, and medical surveillance.
- Some toxins are “Select Agents” and require registration.

Select Agents

- Possession, use and transfer of specific biological agents requires registration with the CDC.
- "Restricted Persons" are not allowed to have access to these agents.
- High security and containment must be maintained.

Security

- Control access to areas where biological agents or toxins are used and stored.
- Keep biological agents and toxins in locked containers.
- Know who is in the lab.
- Know what materials are being brought into the lab.
- Know what materials are being removed from the lab.
- Have a protocol for reporting incidents.
- Have an emergency plan.

Emergencies

- Develop and practice plans for:
  - Spills: large spills, spills inside BSC
  - Accidental exposures: needle sticks, eye/mucous membrane splash, breathing aerosols
  - Power/Utility failures: BSC, freezers, ventilation, lights, water
  - Fires
  - Medical emergencies

Import Permits

- **CDC:** a permit is required to import etiologic agents of human disease and any materials, including live animals or insects, that may contain them. Unsterilized specimens of human and animal tissues (such as blood, body discharges, fluids, excretions or similar material) containing an infectious or etiologic agent require a permit in order to be imported.
- **APHIS:** a USDA veterinary permit is needed for materials derived from animals or exposed to animal-source materials.

Waste Disposal

- "Red bag" or "Regulated Medical Waste":
  - All mammalian cells or anything that came in contact with mammalian cells
  - All BSL 2 material or anything that came in contact with BSL 2 material
  - All needles/syringes regardless of use
- No need to autoclave this waste prior to disposal in EH&S red bag/box (material is incinerated).

Resources

- CDC Biosafety in Microbiological and Biomedical Laboratories
- Canadian MSDSs
- Environmental Health & Safety – Lab Safety

Risk groups, biosafety levels, practices and equipment

BSL	Laboratory type	Laboratory practices	Safety equipment
1	Basic teaching, research	Good microbiological techniques	None Open bench work
2	Primary health services; diagnostic services, research	Good microbiological techniques, protective clothing, biohazard sign	Open bench PLUS biological safety cabinet for potential aerosols
3	Special diagnostic services, research	As BSL 2 PLUS special clothing, controlled access, directional airflow	Biological safety cabinet and/or other primary devices for all activities
4	Dangerous pathogen units	As BSL 3 PLUS airlock entry, shower exit, special waste	Class III biological safety cabinet, positive pressure suits, double ended autoclave (through the wall), filtered air

Regulations

- OSHA Blood borne Pathogens

- CDC Select Agents
- NIH Guidelines for Research Involving Recombinant DNA Molecules
- DOT/CDC Shipping
- CDC Import Permits
- USDA/APHIS Permits

References

1. Collins, C.H., and Kennedy, D.A. Laboratory-acquired infections. In: Laboratory-acquired infections: history, incidence, causes and preventions. Oxford, UK: Butterworth-Heinemann, 1999;1-37.

2. Harding, A.L., and Brandt Byers, K. Epidemiology of laboratory-associated infections. In: Fleming, D.O., and Hunt, D.L. Biological safety: principles and practices. Washington, DC: ASM Press, 2000;35-54.

3. Sewell, D.L. Laboratory-associated infections and biosafety. ClinMicrobiol Rev 1995; 8:389-405.

4. Containment standards for veterinary facilities. Ottawa: Agriculture and Agri-Food Canada, Minister of Supply and Services Canada, No. 1921/E, 1996.

5. Laboratory biosafety manual. Geneva: World Health Organization, 1993;1-133.

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Contributory Article (Section in English)

CONSERVATION OF BIO-RESOURCES: PLANT TISSUE CULTURE

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Abstract

We are living in the age of sky skippers and when Human intrupts the nature then usually problems occurs and because of pollution and other changeswe are now facing the problem of disappearing of plant specieses so the conservation of bioresources is now become very important.

Bioresources are organic substances which can be used by humans for multiple purposes. They are used to produce food and feed, material products such as pulp and paper, timber or chemicals but also as energy source. [1]

Text Matter

To conserve the bioresources is the process is known as the conservation of bioresources. There are two methods of Conserving plant species:

1. In-situ conservation.
2. Ex-Situ Conservation.

In-situ conservation, the conservation of species in their natural habitats, is considered the most appropriate way of conserving biodiversity. Conserving the areas where populations of species exist naturally is an underlying condition for the conservation of biodiversity. That's why protected areas form a central element of any national strategy to conserve biodiversity.Ex-situ conservation is the preservation of components of biological diversity outside their natural habitats. This involves conservation of genetic resources, as well as wild and cultivated or species, and draws on a diverse body of techniques and facilities. Some of these include:

- Gene banks, seed banks, sperm and ova banks, field banks.

- In vitro plant tissue and microbial culture collections;
- Captive breeding of animals and artificial propagation of plants, with possible reintroduction into the wild.[2]

Plant tissue culture is a most appropriate way of conserving a plant species. It is a technique through which we can generate a whole plant from a tissue of that particular plant.

Plant tissue culture is a collection of techniques used to maintain or grow plant cells, tissues or organs under sterile conditions on a nutrient culture medium of known composition. Plant tissue culture is widely used to produce clones of a plant in a method known as Micropropagation. [3]

Process of Plant Tissue Culture

First of all choose an Explant (It can be any part of the plant). Then sterilize (Surface Sterilization) the explants because there are so many micro-organisms which can be on the Surface of explants, surface sterilization is the appropriate way. [4] usually alcohol and sodium or calcium hypochlorite or mercuric chloride are used to sterilize the explants. Mercuric chloride is seldom used as a plant sterilant today, unless other sterilizing agents are found to be ineffective, as it is dangerous to use, and is difficult to dispose of.

Then after Explants are usually placed on the surface of solid culture media, here we need to know that the Culture mediums are of two types-

1. Solid Culture Medium
2. Liquid Culture Medium/ Nutrient Broth

Culture mediums are composed of organic materials like Potassium, Nitrogen, Phosphorous, Growth Regulators, Hormones, Sugars, Calcium , Magnisium, Vitamins, Distilled Water (plant tissue culture grade water) and Zinc, Iron as micro nutrients. Acids And Bases to maintain the pH. Both The mediums contains same nutrients except Agar, which is a gelling agent. The composition of medium can differ in the reference of plant species to be cultured. [5]

After making the culture medium we have to sterilize the medium by the help of autoclave, which works on the conceopt of Steam Under Presssure.

Then pour the culture medium in to the culture tube or in the flask if we are taking a culture tube then we have to prepare the slant so that explant can get a large surface to grow, under the Leminar Air Flow and then pick an explant and stuck in to the medium containg culture tube or flak and then plug a cotton plug on the mouth of flask/culture tube then place them in the proper conditions to grow, after 7-8 days we'll get the callus (group of undifferenciated cells) and then sub culture the callus and add Cytokine in an appropriate concentration for the shooting, after getting shoots we have to add Auxin so that we can get the rooting.

After developing Root and shoot we can place the mini plants in to the small rackes which contains soil and sand mixture in Green House after the growth we can place these plant in to the soil.

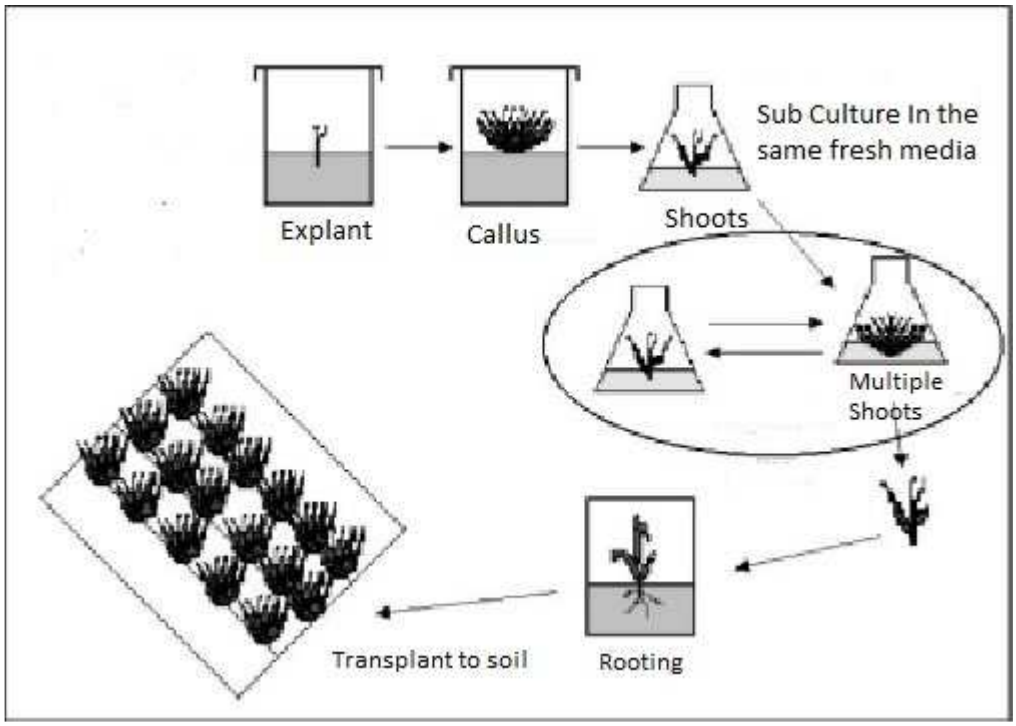

Figure Showing: Stages of plant tissue culture.

Conclusion

Plant tissue culture is used widely in the plant sciences, forestry, and in horticulture.

The commercial production of plants used as potting, landscape, and florist subjects, which uses meristem and shoot culture to produce large numbers of identical individuals.To conserve rare or endangered plant species. A plant breeder may use tissue culture to screen cells rather than plants for advantageous characters, e.g. herbicide resistance/tolerance. Large-scale growth of plant cells in liquid culture in bioreactors for production of valuable compounds, For production of doubled monoploid (dihaploid)plants from haploid cultures to achieve homozygous lines more rapidly in breeding programmes, usually by treatment with colchicine which causes doubling of the chromosome number.[6][7][8]

Hypericum perforatum L. tissues were extracted in collaborative research with USDA Plant Biochemist at the Plant protection and Nutrition Laboratory at Cornell University, Ithaca, N.Y. Hypericin and pseudohypericin were characterized using thin layer chromatography and spectrophotometric analyses. The abundance of hypericin in *Hypericum* was confirmed, and new work to focus on productivity of these compounds in vivo and in vitro is imminent. [9]

References

1. http://bioresource.eu/bioresources/
2. http://carnegiescience.edu
3. http://en.wikipedia.org/wiki/Plant_tissue_culture
4. Indra K. Vasil; Trevor A. Thorpe (30 June 1994). *Plant Cell and Tissue Culture*. Springer. pp. 4–. ISBN 978-0-7923-2493-5. Retrieved 3 April 2013.
5. B. N. Sathyanarayana (1 January 2007). *Plant Tissue Culture: Practices and New Experimental Protocols*. I. K. International Pvt Ltd. pp. 106–. ISBN 978-81-89866-11-2. Retrieved 1 April 2013.
6. Bhojwani, S. S.; Razdan, M. K. (1996). *Plant tissue culture: theory and practice* (Revised ed.). Elsevier. ISBN 0-444-81623-2.
7. http://www.nrcresearchpress.com/doi/abs/10.1139/x2012-022
8. Georgiev, Milen I.; Weber, Jost; MacIuk, Alexandre (2009). "Bioprocessing of plant cell cultures for mass production of targeted compounds". *Applied Microbiology and Biotechnology* **83** (5): 809–23.
9. http://www.desu.edu/current-research-tissue-culture-biotechnology

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